

mostly those of the two different anthers; next the style elevates itself, and so the stigma comes out of the narrow slit in the sheath, and receives pollen from some of the older spadices.

After fertilization the thread like stigmas disappear and at the same moment will be found clusters of as yet unopened anthers around the stigmaless gynœcia, these now having fertilized ovules. This was probably the stage observed by Hofmeister when he described the fertilization as taking place inside the unopened inflorescence. Certainly the anther lobes are not at this stage always emptied of their contents, and certainly when the emptying takes place the gynœcia are often beyond the power of being fertilized.

The condition of the buds also engaged Engler's attention, because the sympodial bud system appeared similar to many Araceæ. The main shoot develops sterile buds from the axil of the nodal scale and then after developing 4 to 6 internodes in the bud grows upward, giving rise to leaves frequently a metre long but never in the same year is inflorescence observed. In the axils of the lower leaves fertile buds are developed which lie alternately to right and left of the main axis. These grow for a great while along with the main axis, the axis of growth thus presenting a flattened cone-shaped form with two furrows superimposed on a cylindrical axis.—C. R. B.

ASPLENIUM BRADLEYI.—During the fall of 1876 while collecting ferns on White River, in northwestern Arkansas, a few specimens of *Asplenium Bradleyi* were found. Since then, by searching closely several localities have been discovered, which have yielded some fine specimens. The species seems to grow upon sandstone, exclusively, as it has not been found on any other formation, and to require situations more or less shaded.

As the plant had never before been found west of the Mississippi River, the discovery is important, because it shows a greater geographical range than the species was supposed to have. It occurs in Kentucky and East Tennessee, and probably will be found across the northern part of this state. The species is not confined to the streams, but has been found upon isolated ledges several miles inland.

Notholena dealbata, Kunze, grows in northwestern Arkansas abundantly, on limestone ledges which are isolated and have a southern exposure. This species, so far as I know, has never been reported from this state, nor farther south than Kansas.—F. L. HARVEY, *Ark. Ind. Univ., Fayetteville, Ark.*

REPLY TO MR. MEEHAN'S CRITICISMS.—*Aquilegia chrysantha*. In Mr. Meehan's observations on the Wheeler Report "it does not strike those acquainted with the" book and its contents "as being particularly careful records of the facts." For Rothrock says that *A. chrysantha* is "hard to distinguish from *A. cœrulea* by any mere description, as they exhibit transition at all points" (Wheeler Rep., p 59, lines 1 and 2). This is not only a similar observation, but also a stronger

statement than mine. Mr. M. has erred again in quoting Rothrock as saying that the flowers are "*always yellow*," "italicizing the words." Mr. R. does not italicize both words and does not say the flowers are always yellow in any but *southern* specimens.

It does not follow because Mr. M. camped at Colorado Springs once that all the species inhabiting its vicinity were found by him. It is as likely that he overlooked *A. chrysantha* as it is certain that he failed to find *Stipa pennata* var. *Americana*, *Anemone cylindrica*, *Psoralea hypogæa* (in the streets), *Asclepias Hallii*, *Eritrichium leiocarpum*, *Pedicularis procera* and many others that I found there, blooming at the same time as *A. chrysantha*. I will say that I have made Colorado Springs my home the greater part of two seasons, doing little else than collecting (securing 1100 species), and would be more apt to know its flora than a transient visitor or even one who camped there once. Besides, Mr. Brandegee found the plant in the Grand Canon of the Arkansas, not 30 miles away in an air line (*Flora Col.* p. 4). My notes were drawn from specimens in my herbarium collected by me at different times and places.

(1) Some specimens have the sepals narrower than petals. (2) Others, broader; sepals 1 inch long, petals over $\frac{3}{4}$ inch; leaflets 12 to 15 lines wide; spur very slender, 2 inches; sepals broad lanceolate; flowers yellow; plant 30 inches high. (3) Others like (2) except sepals lanceolate or oblong-lanceolate narrower than petals. (4) Like (2) except leaflets 6 lines wide (plant as tall). (5) Like (2) except sepals and petals almost equal; sepals and spurs blue; plant 24 inches high. (6) Others like (2) except leaflets $2\frac{1}{2}$ inches wide; flowers size of (2) or one-fourth smaller.

Two years ago specimens of this plant were taken up and set out at Colorado Springs. The flowers were yellow when taken up but have been blue since. I have seen the plant in bloom.

Malvastrum coccineum is common on the plains, often in large patches. There is no other common plant (on the plains) known to be poisonous (except the "Loco" which does not act that way). That 1,200 sheep died in 4 hours after being turned upon a large patch of *M. coccineum* the owner of the sheep knows too well. Botanists can afford to wait a chemical analysis of the plant, but stockmen cannot.

Neillia Torreyi. The "thick pubescence" does not "follow all the forms found in Colorado." I have specimens with glabrous pedicels and calyx. Mr. Meehan's distinction of acute, apiculate sepals in *N. opulifolia*, and obtuse sepals in *N. Torreyi* holds good in all my specimens. The pubescent pods of *N. Torreyi* and glabrous pods of *N. opulifolia* do not seem to be constant, at least I have a number of specimens with very slender pedicels, 2 inches long, pedicels and calyx either glabrous, slightly pubescent or woolly; leaves 3 inches by 2 inches, slightly three lobed, and doubly crenate (not incised); flowers 35 to 40; pods as densely pubescent as Utah specimens of *N. Torreyi*.

Smilax herbacea, L. var. *inodora* I found August 8, 1878, in Platte

Canor, but having only the fruit I delayed naming it till I secured the flowers. — MARCUS E. JONES.

NOTE. — Since writing the note on *Malvastrum coccineum*, further correspondence leads me to believe that the large number of sheep lost by Mr. Ruble was caused largely, if not wholly, by poisonous water oozing out of an embankment in the midst of a large patch of *Malvastrum*. I am glad to be able to add this item of evidence in favor of the plant. There are, however, a number of other complaints about this plant yet to be settled. — M. E. J.

THE FLORA OF ST. CROIX AND THE VIRGIN ISLANDS, by Baron Eggers. — This is No. 13 of the Bulletin of the U. S. National Museum and is quite a thick pamphlet, containing 133 pages. Some 21 pages are devoted to a general description of the position, geology and climate of the islands, with remarks upon the characteristic plants. The vegetation is divided into four groups, called the "littoral," the "shrubby," the "sylvan," and the "region of cultivation." The author comes to the conclusion "that at a former period all the West India islands have been connected mutually, and perhaps with the American continent also, during which time the plants in common to all the islands, as well as to the West Indies and the continent, have expanded themselves over their present geographical areas, at least as far as they are not possessed of particular faculties for emigration over the sea."

Then follows a catalogue comprising 1,013 species of phænogamous and vascular cryptogamous plants, of which 881 are indigenous and 132 naturalized. The proportion between Mono- and Dicotyledonous plants indigenous and naturalized is 1 to 5.8; in the indigenous ones alone 1 to 4.9, thus showing the plurality of the recently introduced plants to have been Dicotyledonous. Five new species are described one of which is a *Rhus*. One looks in vain for the familiar heading *Compositæ* and hardly recognizes it under the form of *Synantherææ*. It seems strange also to see all the grasses and sedges put before the *Liliacæ* and the other kindred families, making the highly specialized Orchids the last of Phænogams. The entire absence of all Ranunculaceous plants is a noticeable feature to workers in our more northern flora.

The report is an interesting one in more ways than can be mentioned in a brief notice and is well worth a careful study.

MOTHS ENTRAPPED BY AN ASCLEPIAD PLANT (PHYSIANTHUS) AND KILLED BY HONEY BEES. — Towards the last of September, Mr. John Mooney, of Providence, an observing man, brought us a stalk of *Physianthus albens*, an Asclepiad plant originating in Buenos Ayres, with the bodies of several moths (*Plusia precatationis*) hanging dead by their proboscides or maxillæ. It was found that the moths had, in endeavoring to reach the pollen pocket, been caught as if in a vise by one of the opposing edges of the five sets of hard horny contrivances covering the pollinia. A few days after, Mr. Everett A. Thompson,